

REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-16, 20 and 21 remain active in this application subsequent to entry of this Amendment.

As a preliminary matter, the Office Action Summary attached to the cover sheet with the current Official Action does not acknowledge receipt of certified copies of the priority documents received by the USPTO in this national stage application. That these documents were in fact received is apparent from the "Notification of Defective Response" dated September 5, 2002 (copy attached) where the PCT Group acknowledges receipt of the "Priority Document". Please acknowledge receipt of this document in the next communication.

The claims have been amended in order to more particularly point out and distinctly claim that which applicants regard as their invention and to advance prosecution. Claims 17-19 have been deleted in order to reduce issues.

Claim rejections – 35 USC §102

1. Claim 1 was rejected under 35USC 102(b) as being anticipated by Ehram et al. (US 4,801,379). Claim 1 has been amended to patentably distinguish the present invention over Ehram, and it particularly now specifies that the porous filter element is itself made from the photosensitive material and that the selective removal of regions in the photosensitive material directly forms voids extending through the photosensitive material and thus constituting filter pores in the filter element. This feature is not disclosed by Ehram et al. In Ehram et al. the photosensitive material is exposed to an interference pattern, and then treated, to form a surface relief pattern which consists of upstanding projections separated by depressions. This photosensitive material is formed as a layer on a substrate 6, for example of glass. This is illustrated clearly in Figure 1c of Ehram et al. and is clear from column 3, lines 19 to 22 which say:

“a photosensitive layer 5 made of a material, for example, selected from the group consisting of paint and lacquer is formed on a substrate 6, for example, a glass plate.”

The formation of the surface relief consisting of projections is clear from column 3, lines 30 to 34 which say:

“the photosensitive layer 5 has a relief surface which is composed of a plurality of discrete protuberances in the form of slender upwardly narrowing teeth 1 with troughs 3 and saddles 4 in between.”

This shaped surface is then used basically as a mold to form the filter element out of another material. Thus the filter element is formed in a different material from the photosensitive material. This is clear from column 3, lines 66 to 68 which say:

“a skin 7 of inorganic material is formed on and over the relief surface of the layer 5 and, particularly, over the teeth 1.”

This layer is shown in Figure 1d with the reference numeral 7. It may be produced by cathode sputter or vacuum vapor coating. It is this layer 7 which ultimately will form the filter element, and not the photosensitive material 5. As can be seen in Figure 1d of Ehram et al., the tops of the projections are then mechanically removed in order to define perforations in the layer 7. It is important to note that no perforations are thus formed in the layer 5, so the photosensitive material layer 5 is incapable of constituting a filter element. Only the layer 7 is capable of being a filter element. This is clear from column 4, lines 2 to 5 which say:

“Thereafter, the inorganic material 7 is removed from over the teeth 1 along with a portion of each tooth 1 in order to define subsequent perforations in the remainder of the skin 7.”

Having formed the holes in the skin 7, the photosensitive layer is then completely removed as explained at column 4, lines 9 to 12 which say:

“Thereafter, the remainder of the photosensitive layer 5 is removed from the remainder of the skin 7 to obtain a foil of inorganic material with a plurality of discrete protuberances 8, each of which has a pore opening 9 in a rest thereof.”

Thus the photosensitive layer has been removed and no longer exists.

Thus claim 1 as amended specifies in lines 1 and 2 that the porous filter element must be made from the photosensitive material. Ehram et al. clearly does not disclose a method of fabricating a porous filter element from a photosensitive material.

Furthermore, claim 1 includes the feature that the selective removal of regions of the photosensitive material directly forms voids constituting filter pores extending through the photosensitive material. Again, this is not true of Ehram et al. The selective removal of regions of the photosensitive material in dependence upon exposure only creates the projections. It is in fact carried out before the layer 7 is added and thus before there is anything which will form a filter element. Further, the voids in the layer 7 which will ultimately form filter pores are not formed by removal of exposed material, but by mechanical removal.

Claim 1 also ends by specifying that the exposed and treated photosensitive material constitutes said porous filter element. Again, this is not true of Ehram et al. because the filter element is formed by the layer 7 which is not the photosensitive material.

Claim 2 to 16, 20 and 21 were rejected under 35USC 102(b) as being anticipated by Ehram et al., but we submit that they are now allowable as dependent from an allowable independent claim.

2. Claims 1 and 10 were rejected under 35USC 102(b) as being anticipated by WO 93/11861. The amendment to claim 1 explained above also distinguishes over the prior art of WO 93/11861 for the same reasons. In particular, WO 93/11861 discloses a method of making a filter element which uses a mask to define the pattern of pores, but the pores are created by an ultraviolet boring technique using ultraviolet ablation. A variety of different masks are disclosed, including steel and nickel masks, but also including a mask made of photosensitive material using interference techniques. However, as with Ehram et al., the photosensitive material does not itself constitute the filter element and the holes in the photosensitive material do not constitute pores of the filter element. This will be explained in more detail below.

Page 8, lines 12 to 15 of WO 93/11861 explains that:

“Membranes may be made using ultraviolet boring techniques with other polymers by incorporating ultraviolet absorbers therein to render the film ablative.”

Further reference to the boring technique is at page 8, lines 32 to 34 which say:

“Ultraviolet ablation techniques may also be used to make membranes of the invention from sheets of some types of glass.”

The general technique for making the filter in WO 93/11861 is explained at page 11, lines 19 to 33. This explains that it is first necessary to provide a mask comprising a sheet with an array of apertures therein (step a). The mask is then positioned in close proximity to the face of a film from which the membrane is to be formed (step b). Thus it is clear that the mask is not itself the filter element, but is being used as a mask in a boring process to produce the filter element from another material. This is emphasized in step c) which recites:

“forming an array of pores simultaneously in the film by application of directional means for boring through the mask”.

Lines 34 to 37 of page 11 explain that:

“Selection of means for boring will be based in part upon the nature of the mask used, the characteristics of the film from which the membrane is being made, and the features desired of the pores.”

Some different techniques are then discussed on page 12.

Page 12, line 19 to page 13, line 9 explains a different way of making a mask using a photoresist material and laser interferometry to achieve the desired exposure pattern. Again, though, this is simply to create a mask which is subsequently used in a boring technique. Thus in step a) the resist material is applied to a face of the film “from which a membrane is to be made”. This emphasizes that it is not the resist material which is the filter. Steps b) and c) refer to exposing of the resist material and the removal of certain areas according to their exposure. Step d) specifies that a cap is then coated onto the resulting structure. This can be, for example, a thick titanium coating (see page

20, line 28) which will actually form the ultimate mask. Then in step e) the remaining portion of the resist are removed together with the cap coating on them, which means that the cap is only left in those areas where the resist was initially removed in step c). Thus the photosensitive material has been completely removed and is now irrelevant to the subsequent formation of the filter itself. The filter is then formed by using a boring technique, wherein the cap areas form the mask.

Comparing this to amended claim 1, therefore, it is clear that it does not disclose a method of fabricating a porous filter element from a photosensitive material. The photosensitive material does not form the filter element in WO 93/11861. It is also clear that the voids in the photosensitive material do not constitute filter pores. The photosensitive material is only being used to pattern the cap (for example titanium) which is going to be the mask in the boring step.

We therefore submit that claim 1 as amended is patentably distinguished over WO 93/11861.

Claim 10 was rejected under the same ground, but we submit that it is now allowable as dependent from allowable independent claim 1.

Claim rejections – 35 USC §103

Claims 6, 13, 19 and 15 were rejected under 35 USC §103(a) as being obvious. We submit that claims 6 and 13 and 15 are now acceptable as dependent from an allowable independent claim (claim 1). Claim 19 has been deleted rendering the objection to it moot.

Further comment on inventiveness

Although claim 1 was not rejected under 35 USC §103, to be of assistance to the examiner applicants offer the following comment. Compared with Ehram et al. the present invention provides an improved method of forming a porous filter element. The method is improved by the features that it is the photosensitive material itself which constitutes the filter element, and the selective removal of regions of the photosensitive material which directly forms the filter pores. There is no suggestion in Ehram et al. that

the selectively removed regions of the photosensitive material should themselves directly constitute the pores of the filter. In fact in Ehram et al. the selectively removed regions (the depressions) are filled by the layer 7 which forms the filter, and the pores in the filter actually correspond to the projections 1, which are regions which were **not** removed.


Furthermore, there is no hint or suggestion that the photosensitive material itself should directly form the porous filter element. In fact in both Ehram et al. and in WO 93/11861 the photosensitive material is completely removed and discarded. In both Ehram et al. and in WO 93/11861 the pores in the filter element are actually made in a different way. In Ehram et al. they are formed by the mechanical removal of the projections as illustrated in Figure 1d. In WO 93/11861 they are formed by ablative burning of the filter material. Thus there is nothing in the prior art documents to suggest the invention as now defined by amended claim 1.

For the above reasons it is respectfully submitted that the claims of this application define inventive subject matter. Reconsideration and allowance are solicited. Should the examiner require any further information, please contact the undersigned by telephone.

Respectfully submitted,

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